

FORM KESEPAKATAN SOAL UJIAN ~~D3~~ / ~~Eks-D3~~ → S1 / S1 / S2 (*)
Semester Genap / Ganjil (*) 2022/2023

Kode – Nama Dosen : D5387 – Harvianto, S.Kom, M.T.I.
D6485 – Ivan Halim Parmonangan, S.Kom., M.Eng.
D6422 – Ajeng Wulandari, S.Kom., M.Kom.

Kode – Nama Mata kuliah : COMP6047001 – Algorithm and Programming

Durasi Ujian : Menit

Sifat Ujian : Buka Buku / ~~Tutup Buku~~*

Buku Ujian :

Supporting Tools : 1 Lembar Catatan ukuran A4 bolak balik.

Penggunaan Supporting File :

Learning Outcomes :

- LO 1 : Explain kind of algorithms in problem solving
- LO 2 : Apply syntax and functions in C language in problem solving
- LO 3 : Construct a program using C language in problem solving
- LO 4 : Design a program with file processing using C language in problem solving
- LO 5 : Choose the best sorting and searching algorithm in problem solving

No	Type Soal (*) (Essay /Kasus)	Bobot (%)	LO Terkait	Topik/Materi yang Diujikan
1	Kasus	25	LO2, LO3, LO5	Struct, searching
2	Kasus	25	LO2, LO3, LO5	Searching
3	Kasus	25	LO2, LO3, LO4, LO5	File, Sorting
4	Kasus	25	LO2, LO3, LO4, LO5	File, Sorting

Keterangan: (*) coret atau pilih salah satu

Jakarta, 1 November 2022

Dibuat oleh,

Dicek oleh,

Disetujui oleh,

(D5387 – Harvianto, S.Kom, M.T.I.

D6485 – Ivan Halim Parmonangan,
S.Kom., M.Eng.

D6422 – Ajeng Wulandari,
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Dosen Pembuat Soal

(D6421 – Muhammad Fikri
Hasani, S.Kom., M.T.)
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**Head of Computer Science
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BINUS University

Academic Career: <i>Undergraduate / Master / Doctoral *)</i>		Class Program: <i>International/Regular/Smart Program/Global Class*)</i>	
<input type="checkbox"/> Mid Exam <input checked="" type="checkbox"/> Final Exam <input type="checkbox"/> Short Term Exam <input type="checkbox"/> Others Exam : _____		Term : Odd/Even/Short *)	
<input checked="" type="checkbox"/> Kemanggisan <input type="checkbox"/> Alam Sutera <input type="checkbox"/> Bekasi <input type="checkbox"/> Senayan <input type="checkbox"/> Bandung <input type="checkbox"/> Malang		Academic Year : 2022/2023	
Faculty / Dept. : School of Computer Science		Deadline	Day / Date : Time : ... Menit
Code - Course : COMP6047001 – Algorithm and Programming		Class : 10-A, 10-B & 10-C (PPTI 14 15 16)	
Lecturer : D5387 – Harvianto, S.Kom, M.T.I. D6485 – Ivan Halim Parmonangan, S.Kom., M.Eng. D6422 – Ajeng Wulandari, S.Kom., M.Kom.		Exam Type : Onsite	
*) <i>Strikethrough the unnecessary items</i>			
<i>The penalty for CHEATING is DROP OUT!!!</i>			

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1. Recruitment [LO2, LO3, LO5]

Jojo & Bibi are planning to establish a JoBi company. There are thousands of people who are sending their CV to the JoBi company. Jojo and Bibi are having a hard time selecting those candidate to be their employee. As their friend, you want to help them choose suitable candidates based on their CVs that match the job requirements.

Format Input

The first line contains a single integer N , the number of applicant who sending their CV to JoBi Company. The next $5N$ lines contain the following, each in their own line:

- ID, the ID of the i -th candidate
- Name, the name of the i -th candidate
- Major, the major of the i -th candidate
- GPA, the GPA of the i -th candidate
- Position, the applied position of the i -th candidate

The next line will contain a single integer T , describing the number of test cases. Each test case has 3 inputs. First input is sting J , the open job position. Second input is string F , the requirement faculty for the candidate. Third input is float S , the candidate's minimum GPA for the job position

Format Output

For each test case, start with the format “Case #X:”, where X is the test case number starting from 1 and followed by the number of applicants selected for JoBi employees.

Constraints

$$1 \leq N \leq 5000$$

$$1 \leq |ID| \leq 10$$

$$1 \leq |Name| \leq 50$$

$$1 \leq |Major| \leq 30$$

$$0.00 \leq GPA \leq 4.00$$

$$1 \leq |Position| \leq 30$$

$$1 \leq T \leq 100$$

Name, Major, and Position is alphanumeric ASCII characters and spaces

Sample Input 1

Input	Output
3 12345 AJENG WULANDARI IT 3.50 LECTURER 67890 IVAN HALIM MATH 3.60 LECTURER 58902 HARVIANTO IT 3.80 LECTURER 1 LECTURER IT 3.50	CASE #1: 2

Sample Input 2

Input	Output
1 11111 AJENG WULANDARI ENGINEERING	CASE #1: 0 CASE #2: 1

3.50 SALES 2 MARKETING BUSINESS 3.25 SALES ENGINEERING 3.50	
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Explanation

In the first sample, there are 3 people send their CV to JoBi Company for Lecturer position. Requirements for this job are IT graduates with a minimum GPA of 3.50. Candidates who pass the requirements are Ajeng Wulandari and Harvianto, so that the output for CASE #1: 2.

2. Concert [LO2, LO3, LO5]

Lili is the event organizer. At first, she could do all the tasks herself. As the business grows, Lili has many staff to help her. One day, she gets a singer as her client. The singer wants to hold concerts in many places in most cities. Imagine there are C cities (numbers $1, 2, \dots, C$) that have a different number of places (P_1, P_2, \dots, P_C) to perform a concert. Lili will divide her staff for those cities, $S \leq C$. Each city can only be assigned to one staff, each staff must work in every place in the city. This means that there is an increase in the number of concerts $0 = E_0 < E_1 < E_2, \dots < E_{S-1} < E_S = C$ so that the i -th staff work in several concerts in the city with the number between $E_{i-1}+1$ and E_i . The time required to do the work for all the concerts is determined by the staff assigned to the most concerts. Therefore, Lili's goal is to minimize the maximum number of concerts set for one staff. Your job is to help Lili find the optimal task for her staff.

Format Input

The first line will contain a single integer T , describing the number of test cases. Each test case has two lines. At the first line, there are two integers C , number of cities and S , number of staff. At the second line, there are integers P_i , number of places in the city (P_1, P_2, \dots, P_C separated by spaces).

Format Output

For each case, print exactly one line. The line must contain the input P_1, P_2, \dots, P_C divided into exactly S parts such that the maximum sum of a single part should be as small as possible. The order of P_i cannot be changed. Use the semicolon character (';') to separate the parts. There must be exactly one space character between any two numbers and one space character between the number and the semicolon.

If there is more than one solution, print the one that minimizes the work assigned to the first staff, then to the second staff, etc. But each staff must be assigned at least one concert.

Constraints

$$\begin{aligned}
 T &\leq 200 \\
 1 &\leq S \leq C \leq 500 \\
 1 &\leq P_i < 10000000
 \end{aligned}$$

Sample

Input	Output
2	100 200 300 400 500 ; 600 700 ; 800 900
9 3	100 ; 100 ; 100 ; 100 100
100 200 300 400 500 600 700 800 900	
5 4	
100 100 100 100 100	

Explanation

In the first case, in 9 cities there are 4500 concert for 3 staff

1st staff = number places in (1st + 2nd + 3rd + 4th + 5th) city

$$= 100 + 200 + 300 + 400 + 500 = 1500 \text{ concert}$$

2nd staff = number places in (6th + 7th) city

$$= 600 + 700 = 900 \text{ concert}$$

3rd staff = number places in (8th + 9th) city

$$= 800 + 900 = 1700 \text{ concert}$$

In the second case, in 5 cities there are 500 concert for 4 staff

1st staff = number places in 1st city = 100 concert

2nd staff = number places in 2nd city = 100 concert

3rd staff = number places in 3rd city = 100 concert

4th staff = number places in 4th city + number places in 5th city

$$= 100 + 100 = 200 \text{ concert}$$

3. Fair Group [LO2, LO3, LO4, LO5]

Jojo is a teacher at a school. Jojo teaches the class. In the class, Jojo have N students. He wants to group his student into 2 groups with a fair separation. He decided to group student based on student scores. And he wants have 2 groups with minimum difference in total score between 2 groups. Jojo ask you to help him to grouping students.

Format Input

The input can be read from the file *testdata.in*.

Input consists of T , the number of testcases. For each case have 2 lines. The first line, contains a single integer N , the number of students. The second line, contains N integers, the score of students.

Format Output

Output should be expressed in format "Case #X: Y" - Y is minimum difference between 2 groups in X-th case.

Constraints

$$1 \leq T \leq 10$$

$$1 \leq N \leq 10^5$$

$$1 \leq A_i \leq 10^6$$

Sample

Input (testdata.in)	Output (Standard Output)
5 6 1 2 3 4 5 6 6 3 1 3 1 3 1 3 2 3 1 5 9 3 1 7 5 3 1 100 2	Case #1: 1 Case #2: 0 Case #3: 0 Case #4: 1 Case #5: 97

Explanation

Case 1:

$$A = \{1, 3, 6\} \rightarrow 1 + 3 + 6 = 10$$

$$B = \{2, 4, 5\} \rightarrow 2 + 4 + 5 = 11$$

$$Sum(B) - Sum(A) = 11 - 10 = 1$$

Case 2:

$$A = \{3, 3\} \rightarrow 3 + 3 = 6$$

$$B = \{1, 3, 1, 1\} \rightarrow 1 + 3 + 1 + 1 = 6$$

$$Sum(A) - Sum(B) = 6 - 6 = 0$$

Case 5:

$$A = \{1, 2\} \rightarrow 1 + 2 = 3$$

$$B = \{100\} \rightarrow 100 = 100$$

$$Sum(B) - Sum(A) = 100 - 3 = 97$$

4. A+B=X [LO2, LO3, LO4, LO5]

Lili have a unique set numbers. And Bibi ask Lili, “From your sets, how many $A + B = X$?”. Lili ask you to help her to count how many $A + B = X$. X is an number from Bibi. A and B is number from Lili’s sets.

Format Input

The input can be read from the file *testdata.in*.

Input consists of T , the number of testcases. For each case have 2 lines. The first line, contains 2 integers N and X , the sets length and the number from Bibi. The second line, contains N integers, the number from Lili's sets.

Format Output

Output should be expressed in format "Case #X: Y" - Y is count $A + B = X$ in X-th case.

Constraints

$$1 \leq T \leq 10$$

$$1 \leq N \leq 10^5$$

$$1 \leq X \leq 2 \times 10^6$$

$$1 \leq S_i \leq 10^6$$

S_i is unique

Sample

Input (testdata.in)	Output (Standard Output)
3 7 5 1 5 3 8 4 2 7 7 9 1 5 3 8 4 2 7 10 11 1 2 3 4 5 6 7 8 9 10	Case #1: 2 Case #2: 3 Case #3: 5

Explanation

Case 2:

$$1 + 8 = 9$$

$$5 + 4 = 9$$

$$2 + 7 = 9$$

Case 3:

$$1 + 10 = 11$$

$$2 + 9 = 11$$

$$3 + 8 = 11$$

$$4 + 7 = 11$$

$$5 + 6 = 11$$

--Good Luck--